Scope of Claims

1. A biodegradable polyester resin composition comprising 100 parts by weight of an aliphatic polyester resin, 1-200 parts by weight of a polycaprolactone, and optionally, inorganic additives, wherein the ratio of total amount of the aliphatic polyester resin and the polycaprolactone with respect to the inorganic additives is 95-50% by weight/5-50% by weight in the case of containing inorganic additives.

2. A biodegradable polyester resin composition as claimed in claim 1, wherein a dicarboxylic acid component includes succinic acid and/or adipic acid, and a diol component includes ethyleneglycol and/or 1,4-butanediol in said aliphatic polyester resin.

3. A biodegradable polyester resin composition as claimed in claim 2, wherein said aliphatic polyester resin is a resin in which an aliphatic polyester resin is highly-polymerized by a diisocyanate compound.

4. A biodegradable polyester resin composition as claimed in claim 1, wherein said inorganic additives are talc.

5. A biodegradable film which comprises molding a polyester resin composition as claimed in any one of claims 1-4.

6. A biodegradable throw-away glove which comprises a biodegradable film as claimed in claim 5.

7. A biodegradable throw-away glove as claimed in claim 6, wherein said biodegradable film is doubled up, said doubled up biodegradable film is formed into a glove-shape by adhesion, and unnecessary portions are cut off.

8. A biodegradable throw-away glove as claimed in claim 7, wherein said adhesion is conducted by heat-sealing.

9. A biodegradable throw-away glove as claimed in claim 6, wherein said glove is employed for gardening, for food processing-handling, for handling medical devices, for working in a clean room.

Sub a2 10. A biodegradable stake which comprises molding a polyester resin composition as claimed in any one of claims 1-4.

11. A biodegradable stake as claimed in claim 10, wherein said stake contains fertilizers and/or chemicals therein.

Sub a3 12. A biodegradable stake as claimed in any one of claims 10-11, wherein said stake is employed for agriculture, and civil engineering or construction.

13. A protecting material for plants which comprises molding a polyester resin composition as claimed in any one of claims 1-4.

14. A protecting material for plants as claimed in claim 13, wherein said material is molded into a net or a sheet.

Sub a4 15. A biodegradable tape which comprises molding a polyester resin composition as claimed in any one of claims 1-4.

16. A biodegradable tape as claimed in claim 15, wherein unevens are formed on one surface or both surfaces of said tape, and said tape is employed for wrapping or packing.

17. A biodegradable tape as claimed in claim 15, wherein at least one of a pressure sensitive adhesive layer, a releasing agent layer, or a heat sealing layer is formed on one surface or both surfaces of said tape.

18. A biodegradable card characterized by employing as a base material a biodegradable resin composition layer comprising 85-5% by weight of a polylactic acid-based resin (A), 5-50% by weight of an aliphatic polyester resin (B), and 10-45% by weight of a polycaprolactone-based resin (C) (total of the (A)+(B)+(C) is 100% by weight) and, further 5-300 parts by weight of fillers (D) based on 100 parts by weight of the total of the (A)+(B)+(C).

19. A biodegradable card as claimed in claim 18, wherein a molecular weight is 30,000-200,000 in said polylactic acid-based resin (A).

20. A biodegradable card as claimed in claim 18, wherein a molecular weight is 40,000-200,000 in said aliphatic polyester resin (B).

21. A biodegradable card as claimed in claim 18, wherein a molecular weight is 40,000-200,000 in said polycaprolactone-based resin (C).

22. A biodegradable card as ~~claimed in claim 18 or 19~~, wherein ~~said~~ polylactic acid-based resin (A) is a polylactic acid homopolymer.

23. A biodegradable card as claimed in claim 18, wherein said fillers (D) are titanium oxide, calcium carbonate, mica, calcium silicate, a white carbon, asbestos, china clay (calcined), glass fibers, or a mixture thereof.

24. A biodegradable card as claimed in any one of claims ~~18~~-23, wherein a magnetic recording layer ~~and/or~~ a thermally-sensitive recording layer ~~or~~ are formed on said biodegradable resin composition layer which is a base material.

25. A biodegradable laminate comprising a biodegradable resin layer (1) composed of an aliphatic polyester resin alone or a lactone resin and the aliphatic polyester resin and at least one of a sheet-like material (2) selected from the group consisting of paper, a pulp sheet, and a cellulose-based film.

26. A biodegradable laminate as claimed in claim 25, wherein a dicarboxylic acid component in said aliphatic polyester resin is composed of succinic acid and/or adipic acid, and a diol component is composed of ethyleneglycol and/or 1,4-butanediol.

27. A biodegradable laminate as claimed in claim 26, wherein said aliphatic polyester resin is a resin in which an aliphatic polyester resin is highly-polymerized by an aliphatic diisocyanate

compound.

28. A biodegradable laminate as claimed in claim 25, which comprises 100-20% by weight of said aliphatic polyester resin and 0-80% by weight of a polycaprolactone (total of the aliphatic polyester resin and the polycaprolactone is 100% by weight).

29. A biodegradable laminate as claimed in claim 25, wherein said biodegradable resin further contains additives for resins.

30. A biodegradable laminated film comprising laminating a biodegradable resin layer (1) with a biodegradable resin layer (2) which is different from the biodegradable resin layer (1), in which total of the layers is composed of at least two layers.

31. A biodegradable laminated film as claimed in claim 30, wherein said biodegradable resin layer (1) or said biodegradable resin layer (2) is composed of at least one resin selected from the group consisting of an aliphatic polyester resin, a polycaprolactone, a cellulose ester, a polypeptide, a polyvinylalcohol, a polyamide, and a polyamide ester.

32. A biodegradable laminated film as claimed in any one of claims 30-31, wherein said biodegradable resin layer (1) is composed of a polycaprolactone, and said biodegradable resin layer (2) is composed of at least one resin selected from the group consisting of a polylactic acid-based polyester, a polyglycol acid-based polyester, a succinic acid-1,4-butanediol polyester, a

succinic acid-ethyleneglycol polyester, a succinic acid/adipic acid-1,4-butanediol copolyester, and an isocyanate-modified polyester thereof.

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33. A biodegradable laminated film as claimed in any one of claims 30-32, wherein said biodegradable resin layer (1) and said biodegradable resin layer (2) comprise coextrusion.

34. A biodegradable laminated film as claimed in any one of claims 30-33, wherein tear strength in said biodegradable laminated film is higher than that in a single layer film composed of said biodegradable resin layer (1), said biodegradable resin layer (2), and biodegradable resin layer (3) based on same thickness, respectively.

35. A biodegradable film for agriculture which comprises a biodegradable laminated film as claimed in any one of claims 30-34.

36. A biodegradable multilayer film or sheet comprising a layer (A) composed of a biodegradable aliphatic polyester resin composition in which 1-200 parts by weight of a polycaprolactone is formulated with 100 parts by weight of the aliphatic polyester resin, and a layer (B) composed of a composition of a polycaprolactone alone or a composition of the polycaprolactone with a biodegradable resin other than the polycaprolactone, said polycaprolactone in the layer (B) is characterized by irradiating solely or together with at least one of other constructing

components by ionizing radiation.

37. A biodegradable multilayer film or sheet as claimed in claim 36, wherein said layer (B) is sandwiched between two layers of said layer (A).

38. A biodegradable multilayer film or sheet as claimed in claim 36, wherein a branched structure is introduced into said polycaprolactone irradiated by ionizing radiation, or gel fraction is 0.01-90% therein.

39. A biodegradable multilayer film or sheet as claimed in claim 36, wherein a dicarboxylic acid component includes succinic acid and/or adipic acid, and a diol component includes ethyleneglycol and/or 1,4-butanediol in said aliphatic polyester resin.

40. A biodegradable multilayer film or sheet as claimed in claim 36, wherein said aliphatic polyester resin is a resin in which a polyester resin is highly-polymerized by an aliphatic diisocyanate compound.

41. A biodegradable multilayer film or sheet as claimed in claim 36, wherein said biodegradable resin other than the polycaprolactone is an aliphatic polyester, a biodegradable cellulose ester, a polypeptide, a polyvinyl alcohol, starch, cellulose, carrageenan, chitin-chitosan components, or a mixture thereof, etc.

42. A biodegradable multilayer film or sheet as claimed in claim 36, wherein said polycaprolactone alone or a composition of the polycaprolactone with said biodegradable resin other than the polycaprolactone further includes a fatty acid amide and/or a finely-powdered silica.

43. A biodegradable film which is composed of a composition of an aliphatic polyester resin with a polycaprolactone, in which the thickness of the film is 5-25 μm, and which is composed of any one of the compositions (1)-(3) described below,

(1) the aliphatic polyester resin has a melt tension of not less than 2 g and a melt flow rate of 1-9 g/10 minutes, and the polycaprolactone is a linear chain type polycaprolactone,

(2) the polycaprolactone has a melt tension of not less than 2 g and a melt flow rate of 1-9 g/10 minutes, and the aliphatic polyester resin is a linear chain type aliphatic polyester resin, or

(3) the composition has a melt tension of not less than 2 g and a melt flow rate of 1-9 g/10 minutes.

44. A biodegradable film as claimed in claim 43, wherein said aliphatic polyester resin (1) is a polyester resin containing a structural unit composed of an aliphatic dicarboxylic acid, an aliphatic diol, 3 or more functional aliphatic polycarboxylic acid and/or an aliphatic polyol or a polyester resin composed of an

aliphatic dicarboxylic acid and an aliphatic diol, and which is modified by a diisocyanate and/or a 3 or more functional polyisocyanate, said polycaprolactone (2) is a crosslinked polycaprolactone or a product obtained by a polymerization using 3 or more functional polyol as an initiator, or said composition (3) is a mixture of the (1) with (2).

45. A biodegradable film as claimed in any one of claims 43-44, wherein said aliphatic polyester resin is a polyester resin containing a structural unit composed of succinic acid and/or adipic acid as a dicarboxylic acid component and ethylene glycol and/or 1,4-butanediol as a diol component.

46. A biodegradable film as claimed in any one of claims 43-45, wherein ratio of said polycaprolactone with respect to said aliphatic polyester resin is 70/30-5/95% by weight (total of both is 100% by weight).

47. A biodegradable film as claimed in any one of claims 43-46, wherein said film is monoaxially or biaxially stretched.

48. A cushion sheet having discontinuous cells in which an embossed film (2) having a large number of projections (3) over all surface of the film is laminated with a plain base film (1) and/or the embossed film (2), characterized in that the embossed film (2) and the plain base film (1) are formed by a polycaprolactone alone or a composition of the aliphatic polyester resin with the

polycaprolactone, and said polycaprolactone is irradiated solely or together with at least one of other constructing components by an ionizing radiation.

49. A cushion sheet having discontinuous cells in which an embossed film (2) having a large number of projections (3) over all surface of the film is laminated with a plain base film (1) and/or the embossed film (2), characterized in that the embossed film (2) and/or the plain base film (1) is composed of a layer (A) which is composed of a biodegradable polyester resin composition in which 1-200 parts by weight of a polycaprolactone is formulated with 100 parts by weight of an aliphatic polyester resin and a layer (B) composed of a polycaprolactone alone or a composition of the aliphatic polyester resin with the polycaprolactone, and said polycaprolactone is irradiated solely or together with at least one of other constructing components by an ionizing radiation.

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50. A cushion sheet having discontinuous cells as claimed in any one of claims 48-49, wherein said polycaprolactone/said aliphatic polyester resin is (70-5)% by weight/(30-95)% by weight (total of both is 100% by weight) in said composition of the aliphatic polyester resin with said polycaprolactone irradiated by an ionizing radiation.

51. A cushion sheet having discontinuous cells as claimed in any one of claims 48-49, wherein said aliphatic polyester resin

contains succinic acid and 1,4-butanediol.

52. A cushion sheet having discontinuous cells as claimed in any one of claims 48-49, wherein a gel fraction is 0.01-10% in said polycaprolactone irradiated by an ionizing radiation.

53. A particle-state article having a degradable thin layer characterized in that the surface of the particle-state article is coated by a polycaprolactone alone or a mixture of the polycaprolactone with at least one kind selected from the group consisting of a natural resin, a cellulose acetate resin, a biodegradable cellulose ester, a biodegradable aliphatic polyester, an olefin polymer, a copolymer containing an olefin, a polyvinylidene chloride polymer, a copolymer containing vinylidene chloride, a diene-based polymer, waxes, a petroleum resin, oils & fats and a modified product therefrom with other coating agents, and said polycaprolactone is irradiated solely or together with at least one of other constructing components by an ionizing radiation.

54. A particle-state article having a degradable thin layer as claimed in claim 53, wherein said particle-state article having a degradable thin layer is a coating fertilizer, coating agricultural chemicals, or microcapsule for carbonless copy paper.

55. A particle-state article having a degradable thin layer as claimed in claim 53, wherein a branched structure is introduced

into said polycaprolactone irradiated by an ionizing radiation, or gel fraction is 0.01-90% therein.

56. A particle-state article having a degradable thin layer as claimed in claim 53, wherein said biodegradable cellulose ester is a biodegradable cellulose ester containing a cellulose acetate having an average substituted group of 1.0-2.15, an average polymerization degree of 50-250, an equivalent ratio of an alkali metal or alkali earth metal with respect to amount of sulfuric acid remained of 0.1-1.1.

57. A particle-state article having a degradable thin layer as claimed in claim 53, wherein said aliphatic polyester is a polyester from a linear chain or branched chain aliphatic diol having a carbon number of 1-10 and a branched chain aliphatic dicarboxylic acid having a carbon number of 1-10, or a polyester from a branched chain aliphatic hydroxylcarboxylic acid having a carbon number of 1-10.

58. A particle-state article having a degradable thin layer as claimed in claim 53, wherein weight ratio of said polycaprolactone with respect to said other coating agents is (50-100)% by weight/(50-0)% by weight (total of both is 100% by weight).

59. A particle-state composition for agriculture and gardening in which a mixture of a polycaprolactone with petroleum

resins and/or rosins is coated on the surface of a particle-state fertilizer.

60. A particle-state composition for agriculture and gardening as claimed in claim 59, wherein said polycaprolactone is mixed in weight ratio of 20-70%.

61. A particle-state composition for agriculture and gardening as claimed in any one of claims 59-60, wherein a number average molecular weight is 500-200,000 in said polycaprolactone.

62. A particle-state composition for agriculture and gardening as claimed in any one of claims 59-61, wherein moisture permeability is not more than 1,000 $g/m^2$-day-1 atm in said coating layer after coating.

63. A biodisintegrable resin composition having comprising 100 parts by weight of a biodegradable resin composition and 5-20 parts by weight of a thermoplastic resin, said biodegradable resin composition is composed of 5-70 parts by weight of a polycaprolactone and 95-30 parts by weight of an aliphatic polyester resin.

64. A biodisintegrable resin composition as claimed in claim 63, wherein said thermoplastic resin is a rubber-modified styrene-based resin.

65. A biodisintegrable resin composition as claimed in claim 64, wherein said rubber-modified styrene-based resin is a rubber-

modified styrene-based graft copolymer having rubber content of 1-20% by weight.

66. A biodisintegrable resin composition as claimed in claim 63, wherein said biodegradable resin composition further contains at least any one of 0.2-5 parts by weight of a fatty acid amide, 0.1-3 parts by weight of a liquid lubricant, 0.1-3 parts by weight of a finely-powdered silica, and 10-40 parts by weight of talc based on 100 parts by weight of total of said polycaprolactone and said aliphatic polyester resin.

67. A biodisintegrable resin composition as claimed in claim 64, wherein said thermoplastic resin has a Dupon't impact strength of not less than 10 kgf-cm/cm$^2$ (sheet thickness of 0.35 mm).